Can Disease Be Linked To Poor Bermudagrass Transition In The Desert Southwest?

Some diseases may be more active during spring transition than once previously thought.

BY BRIAN WHITLARK AND GABE TOWERS

Turf diseases like large patch and bermudagrass decline historically have not been identified as significant stresses that may delay bermudagrass recovery following overseeding. Is there a possibility that these organisms are responsible for more damage to bermudagrass than previously thought?

The objective of this article is to increase awareness of these diseases in the Desert Southwest and to discuss options for turf managers should they observe disease symptoms at their facilities.

LARGE PATCH DESCRIPTION

Large patch is caused by the fungus *Rhizoctonia solani* and occurs in the fall and spring. As the name suggests, the disease is characterized by the development of large circular patches in the turf, ranging in diameter from less than 3 feet to 30 feet or larger. The turf may appear orange on the outer margin of the patches, indicating the disease is active. The patches are often perennial in nature, slowly expanding in diameter annually. The fungus is favored by cool temperatures and wet soil and may be especially severe in poorly drained, nutrient-rich turf. Infection at lower elevations in the Desert Southwest likely begins from mid to late September through late October, depending on location, and continues until average air temperatures fall below 50 degrees Fahrenheit.

LARGE PATCH SPOTTED IN SOUTHERN ARIZONA

In early December 2013, large patch was identified at several golf courses in Phoenix and surrounding cities. The

Large patch was sighted in this 419 bermuagrass fairway overseeded with perennial ryegrass in mid-December 2013.

*Large-patch disease (*Rhizoctonia solani*) was observed at numerous locations in southern Arizona and southern California following December rains on non-overseeded bermudagrass areas.*

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disease symptoms were observed in both non-overseeded and overseeded bermudagrass, although the disease is often difficult to see under an overseeded ryegrass canopy. Several golf course superintendents noted the fungus increased in intensity following mid-December rain events that produced over 1 inch in most locales.

BERMUDAGRASS DECLINE DESCRIPTION

The causal agent of bermudagrass decline is *Gaeumannomyces graminis* var. *graminis*. This organism is slow to develop in bermudagrass, potentially requiring several years to produce visible symptoms. The fungus causes thinned turf and irregularly shaped patches that are yellow, brown, or bronze in color and can measure up to 20 feet in diameter. Over time, the patches often coalesce into larger, erratically shaped areas. Infected bermudagrass roots, stolons, and rhizomes appear dark brown to black in color. Bermudagrass decline infected turf can often be easily ripped from the soil, similar to a serious grub or nematode infection. Infected turf often responds poorly to fertilization and irrigation as a result of a weakened root system. Infection in the Desert Southwest is thought to initiate in mid September in southern Nevada and at higher elevations in southern Arizona. Bermudagrass decline infections at lower elevations in southern Arizona and the Palm Springs area typically begin in late October. The hot, humid weather common during the summer "monsoon" season in the Southwest elicits ideal growing conditions for this organism. Infection continues throughout the winter, although at a slower pace, and increases as warmer temperatures return in the spring. Aboveground disease symptoms in the spring and summer are the result of active infection during the previous fall and winter.

*Bermudagrass stolons infected with bermudagrass decline disease (*Gaeumannomyces graminis *var.* graminis*) are black or dark brown in color.*

Tifeagle bermudagrass infected with bermudagrass decline disease easily rips apart due to weak roots and unhealthy stolons and rhizomes.

BERMUDAGRASS DECLINE SIGHTINGS IN SOUTHERN ARIZONA

The pathogen that incites bermudagrass decline disease can be observed growing on almost all putting greens, tees, fairways, and roughs in southern Arizona. While it is routinely identified in disease diagnostic samples, this organism has not been identified as a significant stress resulting in poor bermudagrass health and density until recently. Bermudagrass decline was identified on putting greens at several courses in Tucson during the summer and fall of 2013 and was responsible for turf damage on at least one facility.

EXPECTATIONS FOR THE SPRING

Large-patch activity ceases during cold periods when bermudagrass is dormant. However, bermudagrass decline remains active during the winter in the Desert Southwest. It is

An ultradwarf bermudagrass putting green infected with bermudagrass decline disease displays thin, weakened turf density.

possible that infected areas are more prone to winter injury, which is a catch-all term that includes several types of damage from low-temperature kill to desiccation and traffic-related injury. As bermudagrass growth resumes in February and March, disease activity increases and may result in weak or dead bermudagrass in affected areas. Large-patch progress slows as temperatures increase in May and affected areas gradually recover with new growth. Bermudagrass-decline damage tends to present later and persist longer than large patch, often continuing well into the fall. Overseeded bermudagrass is at a distinct disadvantage when compared to non-overseeded turf, and infected areas may not recover until August or later. If the diseases are not controlled, they will likely return annually in the fall and spring.

MANAGEMENT OPTIONS

The increase in bermudagrass decline and large patch in 2013 and early 2014 indicates that these diseases may be affecting large areas at some golf courses. The underlying question is whether a fungicide application is warranted and if it will expedite bermudagrass recovery following overseeding. It is difficult to quantify the potential damage either disease can cause to overseeded bermudagrass or their ultimate effect on spring transition; however, golf course superintendents are encouraged to deploy a variety of disease-suppression strategies to evaluate the efficacy of various programs at their facilities. Several disease-management options for turf managers facing disease pressure are offered in this article. The strategies labeled "Both" indicate tactics that can be effective on large patch and bermudagrass decline; the remaining suggestions are specifically labeled for the disease targeted.

- Both — Thatch management is critical. Conduct verticutting in June, July, and August during periods of active bermudagrass growth.
- Both — Wet soils exacerbate disease pressure. Conduct aeration, install drainage where appropriate, and closely monitor soil moisture to avoid wet conditions.
- Large patch — Avoid nitrogen applications when the disease is active. On overseeded turf, utilize a liquid-based nitrogen program to encourage the growth and color of ryegrass.
- Large patch — Do not apply granular nitrogen to infected areas in the spring.
- Bermudagrass decline — Collect annual soil tests and monitor manganese levels. Apply manganese at a rate of 2 pounds per acre on a monthly schedule or to sustain 35 parts per million or greater in soil tests.
- Bermudagrass decline — High soil pH increases disease susceptibility. Efforts to reduce pH may reduce bermudagrass decline disease pressure.

- Both — Map infected areas and initiate fall fungicide applications when thatch temperatures decrease to 70-75 degrees Fahrenheit — typically early September through late October, depending on location. Spray one half of an infected fairway and repeat on several fairways to observe differences between treated and non-treated areas.

- Late summer aeration is critical for fall disease management. Small-diameter solid tines are effective and non-disruptive during late summer.

- Research published in 2004 from Clemson University suggested that mancozeb (Fore 80 WP) applied at 8 ounces per 1,000 square feet in combination with fosetyl-Al (Aliette Signature) at 4 ounces per 1,000 square feet enhanced bermudagrass transition. Products with green pigment were more effective at expediting bermudagrass recovery.

- Additional fungicide options include:

  Azoxystrobin (Heritage) — Both

  Flutolanil (Prostar) — Large patch only

  Myclobutanil (Eagle)* — Large patch only

  Pyraclostrobin (Insignia) — Both

  Thiophanate methyl (3336) — Both

  Triadimefon (Bayleton)* — Both

  *Note: DMI fungicides such as myclobutanil, triadimefon, and difenoconazole should be used with caution on bermudagrass, and consecutive applications should not be made during or recently after dormancy break or when temperatures are expected to exceed 85 degrees Fahrenheit.

Is it possible that the poor bermudagras recovery in this fairway can be linked to disease during the previous fall and spring seasons?

- Both — If the fall application window was missed, apply a fungicide in the spring as the bermudagrass begins to emerge from winter dormancy.

- Both — Preventative fungicide applications yield significantly better control compared to a curative strategy.

CONCLUSION

At this point, the extent that either disease affects bermudagrass recovery from overseeding — i.e., spring transition — is unknown. However, turf managers are encouraged to experiment with a combination of disease-control strategies offered in this article and evaluate the efficacy of each compared with non-treated areas. The implementation of several key cultural and chemical disease-management options will not only aid in disease suppression but will yield improved bermudagrass health and playability. Although this article does not resolve the question of the degree these diseases affect bermudagrass transition, it does raise awareness of disease pressure throughout the Desert Southwest. Furthermore, this article encourages turf mangers to deploy a variety of disease-suppression strategies while evaluating their effectiveness in order to improve and refine long-term management plans.

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